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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,797	05/26/2006	Alain Guillard	Serie 6423	7256
Linda K Sussell Air Liquide Intellectual Property Department 2700 Post Oak Blvd Ste 1800 Houston, TX 77056			EXAMINER HAMO, PATRICK	
			ART UNIT 3746	PAPER NUMBER
			MAIL DATE 05/12/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/580,797

**Applicant(s)**

GUILLARD ET AL.

**Examiner**

PATRICK HAMO

**Art Unit**

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 May 2007.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13-22 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 13-22 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 26 May 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date 5/26/06  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "at least one distillation column" and the "means for vaporizing the liquid by heat exchange with a compressed gas" of claim 19 and variations of this limitation requiring a heat exchanger in claims 20 and 22, and the "system of columns" of claim 21 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

Claim 15 is objected to because of the following informalities: the phrase --the cooler of-- seems to be missing between the words "in which" and "the final stages". The claim as presented recites a pressure drop in the compressor instead of in the cooler, which would be inconsistent with the specification and with the state of the art of compressors. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

Claims 19, 20 and 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites the limitation "means for sending compressed air" in lines 2-3 of the claim. There is insufficient antecedent basis for the limitation "compressed air" in the claim. The claims have been drawn to compressors for compressing gas. "Compressed air" is interpreted as a compressed gas for examination purposes. Claim 20 depends from claim 19 and is likewise rejected.

Claim 22 recites dependency to the method of claim 13, however no method was recited in claim 13. It seems that claim 22 was intended to be dependent from method claim 21. For purposes of examination, claim 22 will be interpreted as dependent from claim 21.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Barchas et al., US 5,082,481.

In regard to claims 13-15:

Barchas discloses a gas compression system comprising 5 stages (12, 18, 24, 30, 36), each stage followed by a cooler system (14, 20, 26, 32, 48/50/52), the pressure drop through the last, furthest downstream cooler system (a set of three coolers) being greater than the pressure drops in the first sets of coolers.

In regard to claims 16 and 17:

The final stage compressor, downstream from all other compressors, has a higher pressure drop due to the multiple coolers coming after the compression stage. In fact, with two coolers identical to each individual cooler in the prior stages, the pressure drop is 100% larger at this stage.

In regard to claim 18:

Barchas discloses that the unit is for separating a gas mixture ( $H_2$ ) from a cracking effluent (Abstract).

In regard to claim 19:

Barchas discloses a cryogenic distillation unit comprising at least one distillation column 60 (col. 6, ll. 5-29), means for sending compressed gas to a column of the unit (via lines 59), means for withdrawing a liquid from a column of the unit (line 61), means for vaporizing the liquid by heat exchange with a compressed gas (where lines 45 and 61 meet), the compressed gas having been compressed by the final stage of the compressor.

In regard to claim 21:

Barchas discloses a method of separating a gas using cryogenic distillation whereby the gas is compressed in the compressor to a pressure of 550-650 psi at the final stage of the compressor.

***Claim Rejections - 35 USC § 103***

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barchas in view of Wong et al., US 6,685,903.

Barchas discloses all of the limitations substantially as claimed except for the following taught by Wong: a heat exchanger 114 for vaporizing the liquid coming from

distillation column 120 using the gas coming from the second stage compressor 122. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the distillation column of Barchas with the heat exchanger system of Wong to cool the discharge liquid from the distillation column.

### ***Allowable Subject Matter***

Claim 22 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Charles G Freay/  
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Patent Examiner, AU 3746